

Office of Marine and Aviation Operations

SAFETY NEWS

From the Safety and Environmental Compliance Division

EIGHTEENTH EDITION

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Message from Mr. Kevin Ivey, Director, SECD

This month's Program News features a very good article on fixed fire fighting systems from the NOAA Small Boat Program and information on electrical safety and a lifejacket Safety Alert provided by the Fleet Inspection Team. The Policy Spotlight section covers information on NOAA Ship Familiarization and New Employee Orientation requirements. Following the Policy Spotlight section are updated accident statistics, and a summary of recent accidents and lessons learned. A review of gangway safety is provided in the Best Practices section. In the News and Notes section, we cover a wide range of topics including arc flash safety, lead soldering hazards, near miss reporting, and kudos to AOC for achieving Level II Certification of their Safety Management System. We hope that the information shared in this newsletter will contribute, in part, to improved safety performance. Please feel free to share your thoughts and suggestions.

Stay safe...



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PROGRAM NEWS

Extinguishing fires in spaces protected by Fixed Gas Fire Extinguishing Systems

By NOAA Vessel Inspections Coordinator, Darel S. McCormick

In reading the [National Transportation Safety Board \(NTSB\) investigation](#) of the engine room fire aboard the Towing Vessel (TV) *Patrice McAllister* which occurred March 27th, 2012, I find many parallels to NOAA's shipboard and small boat fleet operations. All NOAA vessels 40' and greater have fixed gas fire extinguishing systems (FFE) protecting spaces containing propulsion machinery or an internal combustion engine of more than 50hp. With the installation of FFE's, specific and detailed procedures must be followed in order for the fire to be successfully extinguished. In addition, spaces containing FFE's must have their fire boundary integrity maintained to effectively contain the extinguishing agent once it has been released. The *Patrice McAllister* investigation revealed several deficiencies both preexisting and during the execution of the extinguishing process. We can take some specific and relevant information from the NTSB report:

1. "The lack of fire dampers in ventilation systems, along with compromised boundaries due to holes, openings, and casual modification, appear to be major problems in containing fires".

How does this relate to NOAA vessels? We have a variety of vessels in our fleet. Some of our vessels are much older than others. As technology evolves, mission requirements change, and life-cycle repairs are conducted, the opportunity can arise for fire boundaries to be inadvertently compromised. I have found equipment mounted over the openings of ventilation ducts in fire boundaries eliminating the ability to secure it in the event of a fire. On the smaller research vessels, scientific equipment is routinely added or removed requiring the installation of wiring and or piping that transits through machinery space fire boundaries. This is a common occurrence on NOAA vessels. Unless these transits are correctly installed the fire boundary may be compromised allowing the extinguishing agent to escape or air to be let in after the fire is extinguished. We look for this extensively during inspections of any NOAA vessel.

2. "The inability to completely secure the engine room's fire boundaries; and the abundance of flammable material throughout the vessel."

When the Master of *Patrice McAllister* ordered the release of the extinguishing agent, the ventilation openings to the machinery space were not closed, nor were they even installed. Although our vessels are fitted with machinery space ventilation dampers, they will do any good if they are not quickly and effectively closed prior to the release of the extinguishing agent. Some dampers will automatically close upon release of the agent, and others require personnel to manually deploy them. In either case crew must be properly trained to quickly deploy or verify automatic systems function during maintenance and testing of the systems. Relying solely on fire servicing companies to ensure complete effectiveness and functionality of these systems is inadvisable. *Trust, then verify* should be the mantra of anyone responsible for overseeing this maintenance.

3. "Contributing to the extent of the fire damage was the crewmembers' compromise of

the fire boundaries when they prematurely began de-smoking the vessel's superstructure..."

The need to quickly resolve the situation and satisfy one's curiosity as to the extent of damage after a fire is a direct cause of number 3. We have to remember that most fires within a vessel compartment are caused from equipment operating outside of its intended parameters. Fire consumes combustibles, damages wiring, and can even melt metals causing catastrophic damage. We have to ask ourselves, *do we really need to get back into that space right now?* The answer is generally, *no*. With that in mind the focus of the response crew should be maintaining the integrity of the fire boundaries, cooling the boundaries to prevent conductive heat spreading the fire, and the safety of the personnel onboard. We don't need to open the space to know if the fire is out. A small amount of smoke will escape through vent closures and will tell you everything you need to know.

BLACK SMOKE: Combustion is evident; fuel needed for combustion is plentiful, and oxygen is present to sustain combustion.

GREY SMOKE: Combustion is minimal; fuel needed for combustion is depleting or removed from the combustion process, and/or oxygen is being depleted or chemically restricted from the combustion process.

WHITE SMOKE: Combustion has terminated; fuel needed for combustion has been removed from the combustion process, and/or oxygen is depleted or removed.

Using visual cues from bulkheads and decks such as blistering paint, furnishings and coverings attached to bulkheads and decks beginning to smoke, or the outright destruction of the fire boundary due to heat damage will give you information on what to do next.

In my career as a Marine Inspection Officer and Casualty Investigator, I have investigated around a dozen machinery space fires that resulted in extensive secondary damage to the vessel outside of the fire's originating area or resulted in complete loss of the vessel. In those cases, one or all of the following circumstances were prevalent in each situation:

- 1. The fixed gas extinguishing system did not function as intended due to mechanical failure(s) of the extinguishing system caused either through poor servicing history or the extinguishing system was not operational prior to the fire.*
- 2. The vessel crew did not effectively extinguish the fire, either from failure to secure ventilation closures within the fire boundary or by not correctly deploying the fixed gas system in accordance with vessel specific emergency procedures.*
- 3. The vessel crew intentionally breached the fire boundaries after the fixed gas system was released, allowing the extinguishing agent to escape and/or allowing fresh air to feed the combustion process and reignite the fire.*

We must have functioning FFE's that have been serviced properly by the appropriate servicing entities. We must also verify this has been done correctly and we must train relentlessly on the procedures to be accomplished to effectively extinguish a fire using FFE's. I can guarantee only two outcomes from a fire. Either you will successfully extinguish the fire

and save your vessel, or you will be rapidly looking for a way to get off of it.

Darel McCormick is the Vessel Inspections Coordinator for the NOAA Small Boat Program. He is a retired USCG Marine Inspection Officer and Marine Casualty Investigator with more than 30 years' experience in the industry.

Fleet Inspection Corner

Shipboard Electrical Safety

The purpose of electrical safety is to minimize the risk of electrical shock through the awareness of electrical hazards. The potential for electrical shock is high aboard ship due to the presence of an ungrounded system, metal, high humidity, salt water, and high voltage equipment. Electrical shock mishaps continue to occur throughout the fleet. All personnel must be familiar with electrical safety precautions, rescue, and first aid techniques.

- Visually inspect portable cables for any signs of an unsatisfactory condition, such as tears, chafing, exposed insulated conductors, and damaged plugs and receptacles. Do not use spliced portable cables.
- Wear rubber gloves when using metal-cased portable electric equipment, or when using electric hand held portable tools in hazardous conditions, wet decks, and bilge areas. Leather gloves must be worn over rubber gloves if the type of work you are doing could damage the rubber glove.
- Do you know what actions to take if you discover an electrical fire? Pass the word, de-energize the system, and then use a CO₂ carbon dioxide extinguisher to fight the fire. Short bursts of CO₂ should extinguish the fire. Use Purple K Powder (PKP) type extinguishers only when CO₂ is not available.

Latest USCG Marine Safety Alert requires an inspection of Revere Lifejacket Models 198RT and 160RT

The issue is the spring-loaded tab in the snap-hook on the waist belt affecting some Revere lifejacket models 198 RT and 160RT. The tab has been found to be too long for both the thick or thin design. When the D-ring of the main waist belt is "hooked," the length of the tab prevents it from snapping closed. With the hook remaining open, the D-ring is not fully secured. The spring-loaded tab may also lose its resiliency.

The Coast Guard recommends that owners/operators that have Revere model 198 RT or 160 RT lifejackets or vests on board their vessels inspect them closely for this potential defect.

Persons who discover problematic snap-hooks should either call 904-562-5900, or email jacksonville.sales@survitecgroup.com for specific directions on how to obtain replacement

snap-hooks.

You can access the original USCG Alert on the Fleet Inspection Website located at

<http://www.omaο.noaa.gov/noaafleetinspection/index.html>

POLICY SPOTLIGHT

Procedure 1201-08, NOAA Ship Familiarization, and Procedure 1201-09, New Employee Orientation, were signed by Admiral Score and became effective on October 8, 2013. These procedures implement the requirements of the International Maritime Organization (IMO) Standards for Training Certification and Watchkeeping (STCW) and Title 46 of the Code of Federal Regulations Part 15.1105, Familiarization and Basic Safety-Training (46 CFR 15.1105).

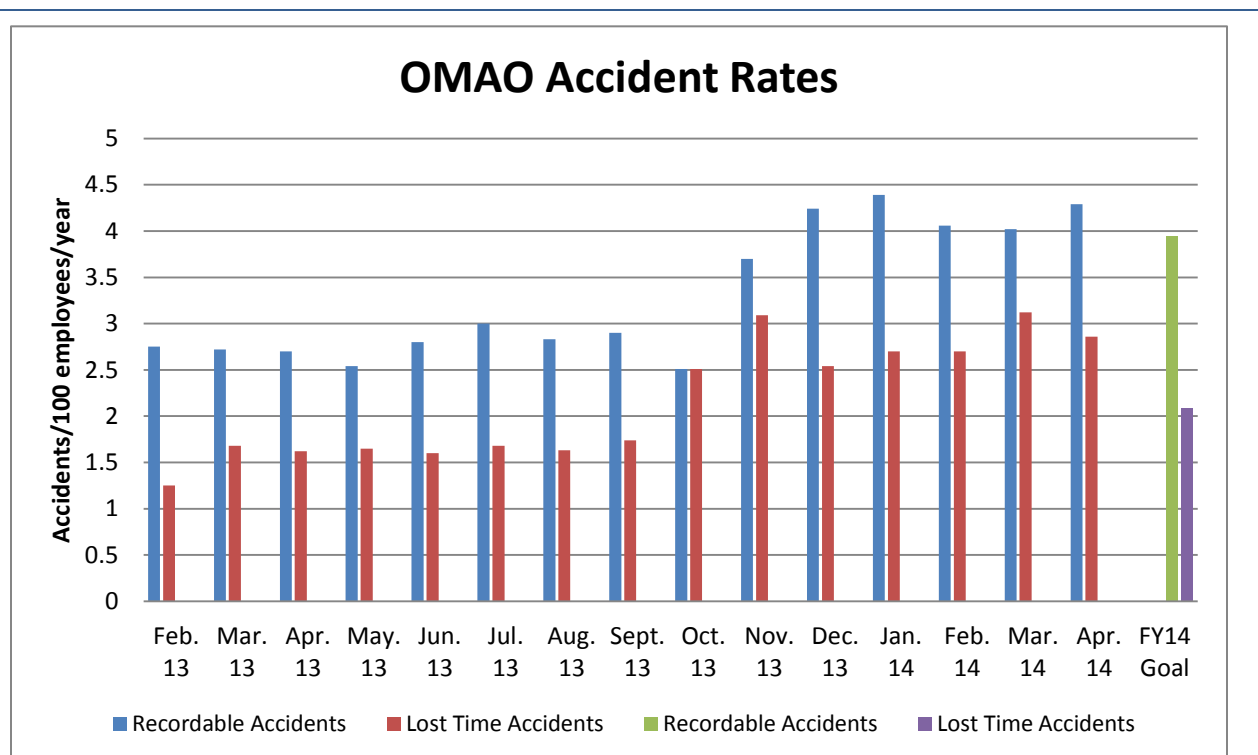
The importance of going through the ship familiarization and employee orientation process cannot be stressed enough. It is not uncommon for accidents and incidents to occur to employees who may be relatively new to a ship. In addition, it is often seen where a failure to follow a particular safety requirement identified in these documents leads to an accident or incident. Please review the requirements contained in these documents on a regular basis. The documents contain checklists that specifically address safety training requirements for shipboard employees.

The list of required training may be used, not only for new employees, but may serve to identify refresher training that could be used during safety stand downs or be required of individuals who may have been involved in an incident in which specific safety policies or procedures were not followed.

The procedures documents are available via the OMAO Document Management System, <http://10.49.29.4/WebDesktop/Binders.aspx>, on the inside OMAO website and the shipboard Tortoise SVN system. Remember to RUN SVN "Update" to stay current.

ACCIDENT STATISTICS

Accident rates over the past 15 months and a corresponding bar graph are shown below. Accident rates are considerably higher compared to what they were a year ago. We are currently above our goals for the year. We continue to see a significant number of contact-with incidents that lead to injury as well as slip, trip, and fall accidents. The number of injuries associated with exertion has also increased. Please make a concerted effort to pay attention to details, like body positioning for example, required to work safely. At the end of the day, it's not just about the numbers. No one wants to be injured. We want everyone to leave work in the same condition as they arrived.



OMAO Annual Accident Rates*

	April 2013	April 2014	FY14 Goal
Recordable Accident Rate	2.70	4.29 ↑	3.94
Lost Time Accident Rate	1.62	2.86 ↑	2.09

*Accident rates are calculated based on the total number of recordable and lost time accidents that occur in the workplace compared to the total number of hours worked by all employees at that workplace. The accident rate represents the number of accidents that have occurred per 100 employees for the year.

RECENT INCIDENTS: CAUSES AND LESSONS LEARNED

This section provides a description of recent incidents that have occurred in OMAO. In many cases, more thorough follow-up investigations have been conducted and more comprehensive lessons learned have been disseminated to targeted audiences within OMAO. The information below is intended to remind us of the importance of staying safe.

Description: While organizing supplies in the wet lab aboard a NOAA ship, a crew member opened a canister which contained 2-3 plastic bags of a white powdery

Description: Before disembarking, a member of the deck department aboard a NOAA ship noticed the gangway needed to be adjusted due to a change in the tide. This

<p>substance which had a chlorine odor. There was a hand-written note on the side of the container, "pool shock for divers." The crew member inadvertently inhaled the substance and immediately placed the cover back on the container. The suspected chemical was later identified by Safety Data Sheet as a hypochlorite mixture that is used by scientists to soak diving gear after exposure to salt water. The crewmember was treated for exposure by showering and rinsing of the mouth and throat. Fortunately the incident did not result in acute illness or injury.</p> <p>Causal Factors: As part of the investigation of the incident, it was determined the material was brought aboard by a member of the scientific party. The hand-written label on the side of the container did not have proper hazard-identifying information. The crew member was trying to further identify the substance so it could be properly stored when the exposure occurred.</p> <p>Lessons Learned: Crew members should contact supervisors and appropriate department heads prior to opening any containers containing unknown materials. Scientific parties are required to properly manage their hazardous materials. All materials are required to be kept in original containers with labeling legible and intact. If a material is transferred to a secondary container, the secondary container is required to be properly labeled with information found on the original container.</p>	<p>is a duty the crew member normally performs, and although it was dark at the time, weather was not an issue. While adjusting the gangway, a board that had been placed under the gangway to help make it more stable slipped out from under the gangway. This caused the entire gangway to shift and come into contact with the crew member resulting in an injury requiring medical attention.</p> <p>Causal Factors: Primary cause in this case (and in many other similar incidents) is a poorly designed or improperly configured gangway arrangement.</p> <p>Lessons Learned: Gangways by nature of their location and purpose can pose unique hazards and are always a potential source for accidents and incidents. Ensure gangways are properly designed and configured. Maintain a gangway watch and make proper adjustments to accommodate for changes in loading and tide. Don't use or traverse a poorly configured or unstable gangway.</p>
<p>Description: A crew member aboard a NOAA ship was bent over cutting a sheet of steel on deck using a blow torch and experienced a sharp pain in the area of the lower back. The crew member then helped carry the cut steel sheet into the ship which may have aggravated the low back pain. The crew member did not believe the injury, which resulted in lost time, was the direct result of any other accident or incident.</p> <p>Causal Factors: The ship reported that the crew member was most likely injured due to</p>	<p>Description: A crew member aboard a NOAA ship was closing the starboard bridge wing door in 25 knot winds. The crew member kept a hand on the door as a brace. A finger caught on the door latch as the door and hand were moved while the door was closed resulting in an injury to the finger that required first aid.</p> <p>Causal Factors: The ship reported the primary cause of the incident as hand placement near a potential pinch point. Ship also reported the door in question can be</p>

using poor body mechanics while cutting the steel sheet. Seas were 5-7 feet at the time, and rolling of the ship could have been a contributing factor.

Lessons Learned: Avoid bending over while performing tasks, especially those that require exertion. Stand upright, or bend at the knees, not at the back. If a job is not being done in response to an emergency, and sea conditions are deemed too rough for a given task, delay the job until there are calmer seas or until the ship returns to port.

difficult to close completely, even in calm weather.

Lessons Learned: Always remain cognizant of hand placement while closing doors especially watertight doors in heavy weather. Use dogging handles to control the door rather than grabbing the door itself. Do not place fingers at the edge of the door or near the door frame. Keep door closures and latching mechanisms properly maintained to ensure smooth operation.

Lessons Learned Safety Bulletins are routinely issued to the fleet on an as needed basis and results of formal Accident Investigations are posted on the following web site:

http://www.oma.noaa.gov/accident_investigations_lessons_learned/index.html

BEST PRACTICES

Gangway Safety – A Reminder

Ship Specific Instructions are required to be developed by all NOAA ships that address Gangway Handling. Below are best practices and key points associated with gangway safety.

Location - The means of embarkation and disembarkation should be positioned clear of the working area and should not be placed near obstructions or where cargo or other suspended loads may pass overhead. Steps should be kept free of oil, grease and ice.

Lighting - Lighting should illuminate the means of embarkation and disembarkation, the position on deck where persons embark or disembark, and the controls for the arrangement.

Lifebuoy - A lifebuoy equipped with a self-igniting light and a buoyant lifeline should be available near the embarkation and disembarkation arrangement for immediate use.

Arrangement - Each gangway should be of such a length to ensure that, at a maximum design operating angle, the lowest platform will be not more than 600mm above the waterline in the lightest seagoing condition, as defined in SOLAS regulation III/3.13. The arrangement at the head of the gangway should provide direct access between the gangway and the ship's deck by a platform securely guarded by handrails and adequate handholds. The gangway should be securely attached to the ship to prevent overturning.

Positioning - Gangways should not be used at an angle greater than 30° from the horizontal, unless designed and constructed for use at angles greater than these and marked as such. Gangways should never be secured to a ship's guardrails unless they have been designed for that purpose. If positioned through an open section of bulwark or railings, any remaining gaps should be adequately fenced. Adequate lighting for means of embarkation and disembarkation and for the immediate approaches should be ensured from the ship and/or the shore in hours of darkness.

Rigging (safety net) - A safety net should be installed in way of gangways where it is possible that a person may fall from the means of embarkation and disembarkation or between the ship and quayside. Additionally, OMAO Procedure 1102-13 - Gangway Handling, states: "When

gangway is rigged perpendicular to the ship, the net should extend 6 feet on either side as practical.”

Maintenance - Accommodation ladders and gangways, including associated winches and fittings, should be maintained and inspected at appropriate intervals, in accordance with manufacturers’ instructions. Additional checks should be made each time the accommodation ladder and gangway is rigged, looking out for signs of distortion, cracks and corrosion. Close examination for possible corrosion should be carried out, especially when an aluminum accommodation ladder or gangway has fittings made of mild steel. Bent stanchions should be replaced or repaired, and guard ropes should be inspected for wear and renewed where necessary. Moving parts should be free to turn and should be greased as appropriate.

The best ideas for improving safety come from the field. Do you have an idea to help prevent injuries? Please send it to the SECD Chief (omao.secd@noaa.gov) or to MOC safety staff at Safeship.moc@noaa.gov and we will plan to share it throughout OMAO.

NEWS AND NOTES

AOC Safety Management System – The Aircraft Operations Center Safety Management System (SMS) was recently Level II certified following a successful audit of the system under the auspices of the International Standard for Business Aircraft Operations (IS-BAO). Obtaining IS-BAO Level II Certification requires verification that the policy and procedures defined by the SMS are being implemented and followed. Congratulations AOC! Well done!

Near Miss Reporting – NOAA Safety and Environmental Compliance Office (SECO) recently acknowledged that OMAO continues to lead all NOAA organizations when it comes to reporting near misses. SECO made the point that performing corrective actions and sharing lessons learned following a near miss is an important component for establishing a positive safety culture and preventing future accidents.

Arc Flash – Arc flash is described by the National Fire Protection Association as “a dangerous condition associated with the release of energy caused by an electric arc.” A reduction of the insulation or isolation distance between energized components is responsible for this condition. Arc flash incidents typically occur in applications exceeding 120 volts. Incidents may occur when a worker fails to ensure that equipment has been properly de-energized prior to servicing or inspection. Arc flash typically results in serious equipment damage and electrical shock to personnel servicing the equipment. The following arc flash safety reminders from Square D Products, a well-known producer of electrical equipment, can help protect employees:

- Establish a written electrical safety program with clearly defined responsibilities covering all of your company’s electrical safety policies, including lockout/tagout, internal safety policies and responsibilities for electrical safety.
- Conduct an electrical system analysis to determine the degree of arc flash hazard present at your workplace. The analysis will define the type of personal protective equipment (PPE) that your workers must use while performing any work when energized parts are exposed.
- Conduct arc flash safety training for all employees. It should be specific to the hazards of

arc flash, arc blast, shock and electrocution. Ensure adequate personal protective clothing and equipment is on hand.

- Ensure the proper tools are on hand for safe electrical work. This includes insulated voltage-rated hand tools and insulated voltage-sensing devices that are properly rated for the voltage application of the equipment to be tested.
- Any electrical equipment that is likely to require examination, adjustment, servicing or maintenance while energized must have arc flash warning labels posted in plain view. Such equipment includes switchboards, panel boards, industrial control panels, meter socket enclosures and motor control centers.
- Maintain all electrical distribution system components. Modern, properly adjusted over-current protective devices that are properly maintained are able to detect an arcing condition almost instantly and clear the fault quickly. This capability significantly reduces the amount of incident energy that is released.
- Finally, maintain and update all electrical distribution documentation. This is especially critical when expanding or modifying engineering plants and electrical systems.

Lead Soldering – Several NOAA offices were recently cited by OSHA for violations related to lead soldering. The OSHA Lead Standard (CFR 1910.1025) addresses worker exposure to lead as an airborne contaminant. Based on standard soldering iron temperatures of 620°F-700°F and the melting point of lead (621°F), with a vapor pressure of 0.0 mm Hg and a boiling point of 3,164°F, it is unlikely that lead fume will be generated during electronic soldering, unless the solder is heated to extreme temperatures. Even when there is no exposure to lead fumes, there is still a need for safe work practices to prevent employee exposure to lead from other routes.

Follow these procedures to prevent ingestion or skin contamination with lead:

- Hands should be washed with soap and water before breaks, before lunch, before smoking, at the completion of soldering, and at the end of the workday.
- Eating and drinking is not permitted in areas where lead soldering is performed. Post a warning sign to that affect.



- Work areas should be kept clean and wiped with a damp paper towel containing soap and water to minimize the accumulation of lead dust in the work area.
- Floors and other surfaces where lead may accumulate may not be cleaned by the use of compressed air.

In addition, use of lead test-swabs is an effective means of testing work surfaces for cleanliness and lead exposure.

Proper Foot ware – Supervisors are reminded that requirements to wear proper foot ware be implemented and enforced. This is especially true for those aboard ship, in the shipyard, or on the hangar deck. Special attention should be paid especially as it pertains to visiting scientific

parties and personnel during the summer months.

Procurement of Personal Protective Equipment – NOAA Finance has requested that we use NOAA Form (NF) 34-6 – *Imprest Fund Purchases* for reimbursing costs associated with the purchase of safety shoes and prescription safety glasses. Effective immediately, submit NF 34-6 for reimbursement of these items. Please do not submit SF 1164 – *Claim for Reimbursement*. See Marine Operations Bulletin 2014-03, dated May 7, 2014, for more information.

TERM OF THE MONTH

Workers' compensation reports and OSHA records – NOAA requires all accidents and incidents to be *reported*. However, only those requiring medical attention above and beyond what would be considered first aid are considered OSHA *recordable*.

In addition, OSHA states that recording an injury or illness neither affects a person's entitlement to workers' compensation nor proves a violation of an OSHA rule. The rules for compensability under workers' compensation differ from state to state and do not have any effect on whether or not a case needs to be recorded under OSHA rules. Many cases will be OSHA recordable and compensable under workers' compensation. However, some cases will be compensable but not OSHA recordable, and some cases will be OSHA recordable but not compensable under workers' compensation. For example, an employee is advised to go to the local Emergency Room to get checked out following an incident at work. The ER exam reveals no serious injury. The injury requires bandaging and the employee is given over the counter medication and returns to work. In this case, the ER visit is most likely covered under workers compensation, but the incident is not OSHA recordable.

COMMON INTERESTS

Home Security Tips and Traps

According to the [Department of Justice and the FBI](#), of the more than 2 million burglaries reported in 2012, 74.5 percent took place in homes, not businesses—and they averaged more than \$2,188 in stolen items, adding up to nearly \$15.5 billion in lost property in a single year!

Despite these alarming statistics, most burglaries are done by amateurs. Taking the right steps—and avoiding others—can significantly reduce your risk.

Security Do's

[Studies](#) have found alarm systems are the single most effective way to reduce the risk of burglary. Also note that houses near wooded areas or in areas with easy access to highways tend to be targeted more often. If you already live in a house fitting that description or want to, don't fear. Just take a few extra precautions—clear bushes and branches away from windows and entrances, install fake or real security cameras in prominent places, perhaps start a neighborhood watch program—and make sure to take the following actions:



- Lock doors and windows. Surprisingly, most burglars simply walk in.

- Keep the garage and tool shed locked, and frost or cover any windows so a burglar can't see if you're home.
- Change your locks when moving into a new house or apartment.
- Install motion detecting exterior lighting around your home.
- When you're out of town, prepare your home to appear occupied. Use a timer to turn lights on and off, and turn your phone's ringer off so that it doesn't ring continuously.
- Burglar-proof large sliding doors by setting a fitted pipe or metal bar in the middle bottom track of the door slide so it can't slide open.

Security Don'ts

While the above to-do's are important safety actions to take, there are also important actions to avoid:

- Don't keep large sums of money or valuables in your house. If you have these items in your home, don't tell anyone and store them in an anchored safe.
- Don't leave notes on your door about where you are or when you'll return.
- Don't hide a key. Leave spare keys with a trusted neighbor.
- Keep expensive electronic equipment and other high-price items out of sight.
- Don't answer personal questions on telephone surveys that may give out information about your possessions or your schedule.
- Even if a stranger asks to use your telephone for an emergency, say no. Offer to make the call for them while they wait outside.
- Never let a door-to-door sales rep or service personnel from a utility company enter your house unless you have an appointment.
- If you use social networking sites like Twitter and Facebook, don't broadcast the play-by-play of your vacation. Post pictures after you get home.

For more help with your home's security, seek advice from a professional security provider or check with your local police, as some departments will perform a free security assessment.

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Safety . . . our mission depends on it